Far Eastern Entomologist

Дальневосточный энтомолог

Journal published by Far East Branch
of the Russian Entomological Society
and Laboratory of Entomology,
Institute of Biology and Soil Sciences,
Vladivostok

Number 173: 1-14 ISSN 1026-051X June 2007

A CONTRIBUTION TO THE ROBBER FLIES OF SUBFAMILIES STENOPOGONINAE AND ASILINAE (DIPTERA: ASILIDAE) FROM IRAN

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Forty nine species of robber flies in 17 genera of subfamilies Asilinae and Stenopogoninae are listed. All of them are newly recorded from Iran. Additionally the preys of all listed asilid species are given.

KEY WORDS: Diptera, Asilidae, robber flies, fauna, prey, Iran.

П. А. Лер, Х. Гахари, Х. Остован. К познанию мух-ктырей подсемейств Stenopogoninae и Asilinae (Diptera: Asilidae) из Ирана // Дальневосточный энтомолог. 2007. N 173. С. 1-14.

Приведен список 49 видов мух-ктырей из 17 родов подсемейств Asilinae и Stenopogoninae. Все они впервые указываются для Ирана. Для всех видов ктырей приводятся сведения о добыче.

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INTRODUCTION

The adult and larvae of robber flies are predators, feeding on various arthropods, mainly insects, and are important agents of biological balance in insect populations (Lehr, 1988; Hayat, Özbek, 1994). Robber flies are diurnal insects. They are found when their prey is active in sunny habitats, mainly during the hottest part of the day. Some species rest on the ground, others sit on the stems of plants vertically and still others sit at the end of branches, resting or waiting for their prey to pass by (Theodor, 1980).

Asilid diversity can be attributed, in part, to the family's broad distribution across many habitats; most species tend to occupy a specific niche. Some species are well adapted to desert climates, where they are known to thermoregulate in response to temperature variations throughout the day. Fewer species occur in woodland areas, and those that do tend to aggregate in clearings, along dirt roads and in the edge environment (O'Neill *et al*. 1988; O'Neill, Shelly, 1990).

The results of Londt (2006) showed that 17 different orders of arthropods have been recorded as preys of Asilidae. Two of these are spider taxa, while the rest are insects. Six insect orders (Coleoptera, Diptera, Hemiptera, Hymenoptera, Lepidoptera and Orthoptera) account for 1912 records, or 96% of all prey items recorded. Diptera dominate in four asilid subfamilies, Hymenoptera in three, Coleoptera in two, and Araneae in one. Although only 34 prey records are available for subfamily Asilinae, the Diptera clearly dominate in the diet of the Asilinae in general, making up 50 % of recorded prey. Other insect orders representing more than 10% of the diet are the Hymenoptera, Lepidoptera and Hemiptera, but the low numbers do not inspire confidence. The best generic data relate to *Caenoura* Londt, 2002, and *Valiraptor* Londt, 2002, each with eight records, and both appear to mirror observations made at the subfamily level. For the subfamily Stenopogoninae, recorded preys consist of Coleoptera, Hymenoptera, Diptera, and Hemiptera together account for 85 % of all prey. The Coleoptera dominate by forming 35 % of the diet. Apart from the most significant genera, *Microstylum* Macquart, 1838 (123) and *Gonioscelis* Schiner, 1866 (74), a few other genera for which there are at least ten records will be briefly discussed below as the Stenopogoninae is particularly rich in genera (Lehr, 1992; Londt, 2006).

There are only a few studies on the Asilidae of Iran. Among Iranian workers, Abbasian-Lintzen (1964a, b) made faunistic and systematic studies on the Asilidae of Iran and identified a few species as natural enemies of some important pests. In these studies some new records and prey records of Asilidae were given.

MATERIALS AND METHODS

The asilids and their preys were collected at different localities in Iran during 1995-2001. They were captured by sweep net, in flight or when they were landing on

the ground. Additionally, several materials of different collections including, Tehran (Science & Research Campus) and Ghaemshahr Islamic Azad Universities, Tehran (Karaj) and Shiraz Universities, and also Isfahan University of Technology were studied. The materials are deposited in the collection of P.A. Lehr (Institute of Biology and Soil Science, Vladivostok). Identifications made by Engel (1930), Oldroyd (1958), Abbasian-Lintzen (1964a, b), Tsacas (1968), Theodor (1980) and Lehr (1988). The taxonomic arrangement and distributional data for regions outside Iran are those of Lehr (1988, 1996), Geller-Grimm (2005) and Bosák and Hradský (2001). The prey specimens were identified by different specialists as Dr. J. Carpenter, USA and Dr. E. Yildirim, Turkey (Vespidae); Dr. T. Ljubomirov, Bulgaria (Sphecidae, Crabronidae); Dr. V. Svihla, Czech Republic (Malachiidae, Melyridae); Dr. A.Y. Kýlýc, Turkey (Tabanidae); Dr. Chien-ming Chao, China (Tachinidae); Dr. T. Pape, Sweden and Dr. R. Richet, France (Sarcophagidae); Dr. R. Hayat, Turkey (Syrphidae); Dr. Y.G. Arzanov, Russia (Curculionidae); Dr. J. Kolarov, Bulgaria (Ichneumonidae); Dr. R. Linnavouri, Finland (Miridae); Dr. M. Canard, France (Chrysopidae); Dr. M. Aslan, Turkey (Coccinellidae); Dr. H. Sevgili, Turkey (Orthoptera).

LIST OF THE SPECIES

Totally 49 species from 17 genera of Asilinae and Stegopogoninae were determined as the new records for Iranian fauna. For these asilid species, 55 different preys from orders Diptera, Coleoptera, Hymenoptera, Neuroptera, Orthoptera and Heteroptera were collected and identified. The species list of Asilidae and their preys are below.

Subfamily Stenopogoninae Hull, 1962

Anarolius jubatus Loew, 1844

MATERIAL EXAMINED: Tehran prov.: Shareyar (1♂, 1♀), X 2001.

DISTRIBUTION OUTSIDE IRAN: Greece, Asian Turkey, Georgia, Armenia, Azerbaidjan.

PREY RECORD: *Larinus (Larinomesius) curtus* Hochhuth 1851 (Coleoptera: Curculionidae).

Anisopogon hermanni (Engel, 1930)

MATERIAL EXAMINED: Fars prov.: Shiraz (Bajgah) (1♀), VII 1999.

DISTRIBUTION OUTSIDE IRAN: Russia (south of European part), Georgia, Armenia, Azerbaidjan, Kazakhstan, Israel, Turkey.

PREY RECORD: *Bibio marci* (Linnaeus 1758) (Diptera: Bibionidae).

***Dioctria abdominalis* Becker, 1923**

MATERIAL EXAMINED: Isfahan prov.: Daran (2♂), VIII 1998.
DISTRIBUTION OUTSIDE IRAN: Turkey.
PREY RECORD: *Euodynerus* (*Euodynerus*) *disconotatus* (Lichtenstein, 1884) (Hymenoptera: Vespidae).

***Dioctria atricapilla* Meigen, 1804**

MATERIAL EXAMINED: Golestan prov.: Maraveh-Tappeh (1♂, 1♀), VII 2001.
DISTRIBUTION OUTSIDE IRAN: Albania, Belgium, Bulgaria, Switzerland, Germany, Denmark, France, Great Britain, Hungary, the Netherlands, Italy, Poland, Romania, Sweden, Finland, Russia (Central and South European territory), Kazakhstan, Mongolia, Turkey.
PREY RECORD: *Calliphora vomitoria* (Linnaeus, 1758) (Diptera: Calliphoridae).

***Dioctria rufonigra* Theodor, 1980**

MATERIAL EXAMINED: Mazandaran prov.: Shirgah (2♀), V 2001.
DISTRIBUTION OUTSIDE IRAN: Israel, Turkey.
PREY RECORD: *Helophilus parallelus* (Harris, 1776) (Diptera: Syrphidae).

***Dioctria striata* Theodor, 1980**

MATERIAL EXAMINED: Fars prov.: Marvdasht, Shiraz (2♂, 1♀), IX 1996. Kerman prov.: Jiroft (1♂), VIII 2001.
DISTRIBUTION OUTSIDE IRAN: Israel, Turkey.
PREY RECORD: *Xanthochelus nomas* (Pallas, 1771) (Coleoptera: Curculionidae).

***Dioctria valida* Loew, 1856**

MATERIAL EXAMINED: Isfahan prov.: Golpaygan (2♂), IX 2000.
DISTRIBUTION OUTSIDE IRAN: Lebanon, Syria, Israel, Turkey.
PREY RECORD: *Temelucha lucida* (Szépligeti, 1899) (Hymenoptera: Ichneumonidae).

***Habropogon similimus* Theodor, 1980**

MATERIAL EXAMINED: Golestan prov.: Gorgan, National Park (3♀), VI, X 2001.
DISTRIBUTION OUTSIDE IRAN: Israel, Turkey.
PREY RECORD: *Coccinella septempunctata septempunctata* Linnaeus, 1758 (Coleoptera: Coccinellidae).

***Heteropogon lehri* V. Richter, 1968**

MATERIAL EXAMINED: Mazandaran prov.: Galogah (1♂, 2♀), V 2001.
DISTRIBUTION OUTSIDE IRAN: Armenia, Turkey.
PREY RECORD: *Malachius* (*Malachius*) *vittatus* Ménétriès, 1832 (Coleoptera: Malachiidae).

***Heteropogon nubilus* (Wiedeman in Meigen, 1820)**

MATERIAL EXAMINED: Fars prov.: Abadeh, Eghlid (2♂, 2♀), VII 1998.
DISTRIBUTION OUTSIDE IRAN: Spain, Portugal, Jordan, Israel, Morocco, Algeria, Tunisia, Turkey.
PREY RECORD: *Campylomma liebknechti* Girault, 1934 (Heteroptera: Miridae) in Abadeh and *Tetrix tartara tartara* (Bolivar, 1887) (Orthoptera: Tetrigidae) in Eghlid.

***Heteropogon scoparius* Loew, 1847**

MATERIAL EXAMINED: Chahar-Mahal & Bakhtiari prov.: Shahrekord (1♂, 1♀), IV 1998.
DISTRIBUTION OUTSIDE IRAN: Albania, Russia (South European territory), Turkey.
PREY RECORD: *Lixus rubicundus* Zubkow, 1833 (Coleoptera: Curculionidae).

***Heteropogon succinctus* Loew, 1847**

MATERIAL EXAMINED: Isfahan prov.: Khansar (2♂), IV 1998.
DISTRIBUTION OUTSIDE IRAN: Turkey.
PREY RECORD: *Pristomerus horribilis* Narolsky, 1987 (Hymenoptera: Ichneumonidae).

***Holopogon nigropilosus* Theodor, 1980**

MATERIAL EXAMINED: Chahar-Mahal & Bakhtiari prov.: Lordegan (2♀), VII 1997.
DISTRIBUTION OUTSIDE IRAN: Turkey.
PREY RECORD: *Ebaeus basipes* Abeille de Perrin, 1891 (Coleoptera: Malachiidae).

***Molobratia egregia* (Loew, 1869)**

MATERIAL EXAMINED: Fars prov.: Shiraz (Bajgah) (1♂, 2♀), VII 1996.
DISTRIBUTION OUTSIDE IRAN: Romania, Georgia, Armenia, Azerbaidjan. Turkey.
PREY RECORD: *Psalidium maxillosum* (Fabricius, 1792) (Coleoptera: Curculionidae).

Molobratia teutonus **(Linnaeus, 1767)**

MATERIAL EXAMINED: Chahar-Mahal & Bakhtiari prov.: Brojen (2♂), IX 1996.

DISTRIBUTION OUTSIDE IRAN: Austria, Albania, Bulgaria, Czech Republic, Germany, Denmark, Spain, France, Greece, Hungary, Italy, The Netherlands, Romania, Sweden, Poland, former Yugoslavia, Russia (Central and South European territory), Turkey.

PREY RECORD: *Mallada flavifrons* (Brauer, 1850) (Neuroptera: Chrysopidae).

Pycnopogon fasciculatus **(Loew, 1847)**

MATERIAL EXAMINED: Golestan prov.: Azadshahr, Galikesh (1♂, 2♀), IV, IX 2001. Mazandaran prov.: Kiakola (2♀), XI.2001.

DISTRIBUTION OUTSIDE IRAN: Albania, Bulgaria, Czech Republic, Spain, France, Greece, Italy, Romania, former Yugoslavia, Azerbaijan, Syria, Israel, Turkey, Morocco, Algeria, Tunisia.

PREY RECORD: *Polistes* (*Sulcopolistes*) *atrimandibularis* Zimmermann, 1930 (Hymenoptera: Vespidae).

Pycnopogon leucostomus **Engel, 1930**

MATERIAL EXAMINED: Mazandaran prov.: Zirab (2♀), VIII 2000.

DISTRIBUTION OUTSIDE IRAN: France, Armenia, Turkey.

PREY RECORD: *Ischnogasteroides picteti picteti* (Saussure, 1852) (Hymenoptera: Vespidae).

Pycnopogon mixtus **(Loew, 1847)**

MATERIAL EXAMINED: Isfahan prov.: Anarak (2♂, 1♀), VI 2001. Kerman prov.: Kahnooj (2♀), IX 2001.

DISTRIBUTION OUTSIDE IRAN: Greece, Georgia, Armenia, Azerbaijan, Jordan, Israel, Turkey, Egypt.

PREY RECORD: *Malachius (Malachius) labiatus* Brullé, 1832 (Coleoptera: Malachiidae) in Anarak and *Melanotmethis fuscipennis* (Redtenbacher, 1889) (Orthoptera: Pamphagidae) in Kerman.

Stenopogon callosus **(Pallas in Wiedemann, 1818)**

MATERIAL EXAMINED: Fars prov.: Darab (1♀), IX 1997.

DISTRIBUTION OUTSIDE IRAN: Bulgaria, Germany, France, Hungary, Poland, Romania, former Yugoaslavia, Russia (South European territory), Georgia, Armenia, Azerbaijan, Kazakhstan, Turkey.

PREY RECORD: *Bellieria melanura* Meigen, 1826 (Diptera: Sarcophagidae).

***Stenopogon coracinus* (Loew, 1847)**

MATERIAL EXAMINED: Golestan prov.: Minoodasht (1♂), IX 2001.
DISTRIBUTION OUTSIDE IRAN: Bulgaria, France, Greece, Hungary, Italy, Romania, former Yugoslavia, Turkey.
PREY RECORD: *Graptus armeniacus* Hochhuth, 1847 (Coleoptera: Curculionidae).

***Stenopogon mollis* Loew, 1868**

MATERIAL EXAMINED: Tehran prov.: Damavand (1♂), VI 2001.
DISTRIBUTION OUTSIDE IRAN: Georgia, Armenia, Turkey.
PREY RECORD: *Campylomma liebknechti* Girault, 1834 (Heteroptera: Miridae).

***Stenopogon nataliae* V. Richter, 1963**

MATERIAL EXAMINED: Mazandaran prov.: Ghaemshahr (1♂, 1♀), XI 2000. Golestan prov.: Gorgan (2♀), VI 2001.
DISTRIBUTION OUTSIDE IRAN: Armenia, Turkey.
PREY RECORD: *Malachius aeneus* Linnaeus, 1758 (Coleoptera: Malachiidae) in Ghaemshahr and *Truxalis robusta* Uvarov, 1916 (Orthoptera: Acrididae) in Gorgan.

***Stenopogon strataegus strataegus* Gerstaecker, 1862**

MATERIAL EXAMINED: Fars prov.: Noor-Abad (3♂, 2♀), VIII 1995.
DISTRIBUTION OUTSIDE IRAN: Greece, Turkey.
PREY RECORD: *Colloceria melancholica* (Gravenhorst, 1820) (Hymenoptera: Ichneumonidae).

***Stenopogon xanthotrichus* (Brullé, 1832)**

MATERIAL EXAMINED: Isfahan prov.: Naiin (1♂, 1♀), IX 1999.
DISTRIBUTION OUTSIDE IRAN: Albania, Greece, Romania, Turkey.
PREY RECORD: *Vespula* (*Paravespula*) *germanica* (Fabricius, 1793) (Hymenoptera: Vespidae).

Subfamily Asilinae Latreille, 1802

***Antipalus truncatus* (Loew, 1849)**

MATERIAL EXAMINED: Fars prov.: Darab, Arsanjan (1♂, 2♀), VII, VIII 1995.

DISTRIBUTION OUTSIDE IRAN: Turkey.

PREY RECORD: *Delta unguiculatum* (Villers, 1789) (Hymenoptera: Vespidae).

***Cerdistus denticulatus* (Loew, 1849)**

MATERIAL EXAMINED: Isfahan prov.: Kashan (2♀), IV 1999.

DISTRIBUTION OUTSIDE IRAN: Bulgaria, Greece, Georgia, Armenia, Azerbaijan, Turkey.

PREY RECORD: *Coccinella septempunctata septempunctata* Linnaeus, 1758 (Coleoptera: Coccinellidae).

***Cerdistus manii* Schiner, 1867**

MATERIAL EXAMINED: Mazandaran prov.: Kiasar, Neka (3♂, 2♀), VI, XI 2000.

DISTRIBUTION OUTSIDE IRAN: Georgia, Armenia, Azerbaijan, Tunisia, Turkey.

PREY RECORD: *Dicranolaius bellulus* Guerin-Meneville (Coleoptera: Melyridae) in Kiasar and *Dasyleurotettix depressus* (Brisout, 1848) (Orthoptera: Tetrigidae) in Neka.

***Didysmachus picipes* (Meigen, 1820)**

MATERIAL EXAMINED: Fars prov.: Fasa, Abadeh (1♂, 2♀), IX 1998; Marvdasht (2♂), VII 1999. Yazd prov.: Meibod (1♀), IV 2000.

DISTRIBUTION OUTSIDE IRAN: Austria, Albania, Czech Republic, Switzerland, Denmark, Germany, France, Hungary, Italy, Norway, The Netherlands, Poland, Romania, former Yugoslavia, Sweden, Finland, Georgia, Armenia, Azerbaijan, Ukraine, Russia (North, Central and South European territory, West Siberia), Kazakhstan, Turkey (Lehr, 1996).

PREY RECORD: *Silvius caucasicus* (Olsufjev, 1937) (Diptera: Tabanidae).

***Dysmachus bifurcus* (Loew, 1848)**

MATERIAL EXAMINED: Mazandaran prov.: Abbas-Abad, Joibar (2♂, 1♀), IX, X 2001.

DISTRIBUTION OUTSIDE IRAN: Austria, Czech Republic, Germany, Denmark, France, Great Britain, Hungary, Romania, Switzerland, Poland, Turkey.

PREY RECORD: *Ammophila heydeni heydeni* Dahlbom, 1845 (Hymenoptera: Sphecidae).

***Dysmachus bilobus* Loew, 1871**

MATERIAL EXAMINED: Golestan prov.: National Park (1♂), VII 2001.

DISTRIBUTION OUTSIDE IRAN: Bulgaria, Romania, former Yugoslavia, Ukraine, Russia (South European territory), Georgia, Armenia, Azerbaijan, Uzbekistan, Kirghizia, Turkey.

PREY RECORD: *Liris niger* (Fabricius, 1775) (Hymenoptera: Crabronidae).

***Dysmachus bimucronatus* (Loew, 1854)**

MATERIAL EXAMINED: Golestan prov.: Galikesh (2♂), VII 2000.

DISTRIBUTION OUTSIDE IRAN: Austria, Bulgaria, Czech Republic, Germany, France, Italia, Hungary, Romania, former Yugoslavia, Ukraine, Russia, Kazakhstan, Turkey.

PREY RECORD: *Tabanus bactrianus* Olsufjev, 1937 (Diptera: Tabanidae).

***Dysmachus cephalenus* Loew, 1871**

MATERIAL EXAMINED: Fars prov.: Jahrom (1♂, 1♀), VII 1999.

DISTRIBUTION OUTSIDE IRAN: Albania, Greece, Bulgaria, former Yugoslavia, Turkey.

PREY RECORD: *Ammophila sabulosa sabulosa* (Linnaeus, 1758) (Hymenoptera: Sphecidae).

***Dysmachus dasyproctus* Loew, 1871**

MATERIAL EXAMINED: Isfahan prov.: Najaf-Abad (1♀), IX 2000.

DISTRIBUTION OUTSIDE IRAN: Greece, Romania, Georgia, Armenia, Azerbaijan, Turkey.

PREY RECORD: *Tabanus bromius flavofemoratus* Strobl, 1908 (Diptera: Tabanidae).

***Dysmachus fuscipennis* (Meigen, 1820)**

MATERIAL EXAMINED: Fars prov.: Eghlid (2♀), VI 1997.

DISTRIBUTION OUTSIDE IRAN: Albania, Bulgaria, Czech Republic, Germany, France, Greece, Hungary, Poland, Italy, Romania, former Yugoslavia, Russia (South European territory, West Siberia), Ukraine, Georgia, Azerbaijan, Kazakhstan, Turkey.

PREY RECORD: *Bembecinus asiaticus iranicus* Schmid-Egger, 2004 (Hymenoptera: Crabronidae).

***Dysmachus praemorsus* (Loew, 1854)**

MATERIAL EXAMINED: Fars prov.: Shiraz (Bajgah) (2♂), VIII 1996.

DISTRIBUTION OUTSIDE IRAN: Austria, Albania, Bulgaria, Germany, France, Hungary, Poland, Romania, forme Yugoslavia, Ukraine, Turkey.

PREY RECORD: *Tabanus filipjevi* Olsufjev, 1937 (Diptera: Tabanidae).

***Dysmachus setipyga* Becker, 1923**

MATERIAL EXAMINED: Tehran prov.: Firoozkooh, Roodhen (1♂, 2♀), VIII, IX 2000. Mazandaran prov.: Pole sefid (1♂), VII 2001.

DISTRIBUTION OUTSIDE IRAN: Turkey.

PREY RECORD: *Atylotus quadrifarius* (Loew, 1874) (Diptera: Tabanidae).

***Dysmachus stylifer* (Loew, 1854)**

MATERIAL EXAMINED: Golestan prov.: Minoodasht (2♂), VI 1999.

DISTRIBUTION OUTSIDE IRAN: Austria, Albania, Bulgaria, Czech Republic, Germany, France, Greece, Hungary, Italy, Poland, Romania, former Yugoslavia, Ukraine, Russia (South European territory), Georgia, Armenia, Azerbaijan, Turkey.

PREY RECORD: *Robineauella pseudoscoparia* (Kramer, 1911) (Diptera: Sarcophagidae).

***Dysmachus tricuspis* (Loew, 1848)**

MATERIAL EXAMINED: Isfahan prov.: Kashan (1♂), X 1999.

DISTRIBUTION OUTSIDE IRAN: Albania, Greece, Romania, Turkey, Tunisia.

PREY RECORD: *Phryxe vulgaris* (Fallén, 1810) (Diptera: Tachinidae).

***Echthistus rufinervis* (Meigen, 1820)**
Asilus cognatus Loew, 1849. Synonymized by Lehr, 1992.

MATERIAL EXAMINED: Fars prov.: Shiraz (Bajgah), Fasa (2♂, 2♀), IX 1998.

DISTRIBUTION OUTSIDE IRAN: Austria, Bulgaria, Switzerland, Czech Republic, Germany, France, Greece, Hungary, Poland, Romania, former Yugoslavia, Ukraine, Russia (South European territory, West Siberia), Kazakhstan, Turkey, Israel.

PREY RECORD: *Tabanus bromius* Linnaeus, 1758 (Diptera: Tabanidae).

***Engelopogon antiochiensis* (Tsacas, 1964)**

MATERIAL EXAMINED: Mazandaran prov.: Kelardasht (2♂), IV 2001.

DISTRIBUTION OUTSIDE IRAN: Turkey.

PREY RECORD: *Hybomitra erberi* (Brauer, 1880) (Diptera: Tabanidae).

***Eutolmus calopus* (Loew, 1848)**

MATERIAL EXAMINED: Golestan prov.: Gonbad (2♀), VI 2001.
DISTRIBUTION OUTSIDE IRAN: Greece, former Yugoslavia, Georgia, Armenia, Azerbaijan, Turkey.
PREY RECORD: *Cerceris tuberculata* Villers, 1789 (Hymenoptera: Crabronidae).

***Eutolmus facialis* (Loew, 1848)**

MATERIAL EXAMINED: Tehran prov.: Damavand (1♂), X 2001.
DISTRIBUTION OUTSIDE IRAN: Former Yugoslavia, Israel, Turkey.
PREY RECORD: *Dasyrhamphis umbrinus* (Meigen, 1820) (Diptera: Tabanidae).

***Eutolmus mordax* (Loew, 1848)**

MATERIAL EXAMINED: Fars prov.: Lar (2♂, 1♀), VI 1997.
DISTRIBUTION OUTSIDE IRAN: Greece, Romania, Russia, (Central European territory), Turkey, Tunisia.
PREY RECORD: *Palarus variegatus* (Fabricius, 1781) (Hymenoptera: Crabronidae).

***Eutolmus parricida* (Loew, 1848)**

MATERIAL EXAMINED: Mazandaran prov.: Nooshahr (2♀), VIII 2001.
DISTRIBUTION OUTSIDE IRAN: Georgia, Armenia, Azerbaijan, Turkey, Afghanistan.
PREY RECORD: *Ramonda spathulata* (Fallén, 1820) (Diptera: Tachinidae).

***Machimus elegans* (Loew, 1849)**

MATERIAL EXAMINED: Isfahan prov.: Flaverjan (2♂), VI 1999.
DISTRIBUTION OUTSIDE IRAN: Spain, Turkey.
PREY RECORD: *Cylindrothecum ibericum* (Villeneuve, 1912) (Diptera: Sarcophagidae).

***Machimus gratiosus* Loew, 1871**

MATERIAL EXAMINED: Chahar-Mahal & Bakhtiari prov.: Brojen (1♀), VII 2001.
DISTRIBUTION OUTSIDE IRAN: Turkey.
PREY RECORD: *Hybomitra peculiaris* (Szilady, 1914) (Diptera: Tabanidae).

Machimus modestus (Loew, 1849)

MATERIAL EXAMINED: Golestan prov.: National Park, Gorgan (2♂, 1♀), VI, VII 2000.

DISTRIBUTION OUTSIDE IRAN: Bulgaria, Hungary, Romania, former Yugoslavia, Turkey.

PREY RECORD: *Myolepta luteola* (Gmelin, 1790) in National Park and *Spiximorpha worelli* (Brãdescu, 1972) (Diptera: Syrphidae) in Gorgan.

Machimus rudis Becker, 1923

MATERIAL EXAMINED: Fars prov.: Firooz-Abad (1♂, 1♀), IV 1995. Yazd prov.: Meibod (2♀), XI 1997.

DISTRIBUTION OUTSIDE IRAN: Turkey.

PREY RECORD: *Calliphora vicina* (Robineau-Desvoidy, 1830) (Diptera: Calliphoridae) in Firooz-Abad and *Tetrix subulata* (Linneus, 1761) (Orthoptera: Tetrigidae) in Meibod.

Machimus setibarbus (Loew, 1849)

MATERIAL EXAMINED: Isfahan prov.: Natanz (1♀), VII 1998.

DISTRIBUTION OUTSIDE IRAN: Greece, Bulgaria, Czech Republic, Germany, Spain, France, Italy, Denmark, Romania, former Yugoslavia, Poland, Sweden, Finland, Russia (Central European territory), Turkey, Israel, Tunisia.

PREY RECORD: *Tachina magnicornis* (Zetterstedt, 1844 (Diptera: Tachinidae).

DISCUSSION

In this study 49 robber fly species was determined as the first records for Iranian fauna. However, studies on Iranian Asilidae are far from complete. Iran is a large country with various geographical regions and climates, so the numbers of prey of asilid species must be much higher than recorded so far. New studies should be conducted on this topic.

In the present research, the following division of the total prey can be made: Diptera 38.18% (Tabanidae 9, Tachinidae 3, Sarcophagidae 3, Syrphidae 3, Calliphoridae 2, Bibionidae 1), Hymenoptera 25.45% (Sphecidae+Crabronidae 6, Vespidae 5, Ichneumonidae 3), Coleoptera 21.81% (Curculionidae 5, Malachiidae 4, Coccinellidae 2, Melyridae 1), Orthoptera 9.09% (Tetrigidae 3, Acrididae 1, Pamphigidae 1), Hemiptera 3.63% (Miridae 2), and Neuroptera 1.81% (Chrysopidae 1). Also the results indicated that the species of subfamily Asilinae had more preys in families Tabanidae, Sphecidae+Crabronidae and Tachinidae and without any prey in Curculionidae, Malachiidae, Miridae and Ichneumonidae. About the Stegopogoninae, the most preys belonged to the families Curculionidae, Vespidae and Malachiidae and without any prey in Tabanidae, Tachinidae and Sphecidae+Crabronidae.

Most published studies show that female asilids are more commonly encountered feeding than males (Londt 1990, 1991, 1995, 1999). Comparisons using current data, resolved at subfamily level, are presented in Table 3. In every instance there were more females than males. While data for the family as a whole show that for every male there are 1.5 females, this relationship may be different for individual subfamilies. Comparative figures arranged in order of the degree of difference are: Apocleinae 1:1.2, Laphystiinae 1:1.5, Asilinae 1:1.6, Trigonomiminae 1:1.8, Laphriinae 1:1.9, Dasypogoninae 1:2.3, Stenopogoninae 1:2.6, Ommatiinae 1:4.5, Leptogastrinae and Stichopogoninae 1:6.0. While little confidence can be placed in the data for the last three subfamilies, because of low sample sizes, some of the other observed differences may be significant. The acceptable extremes appear to be the figures provided for the Apocleinae, where females only outnumber males by 1.2 to 1, and those given for the Stenopogoninae where the difference is much greater at 2.6 to 1. A factor that might contribute to observable differences is the relative size difference between males and females. Although measurements have not been taken, in many instances, males are generally smaller than females, and so are probably less visible during collecting expeditions, resulting in the collection of fewer individuals with prey. However, to counter this possibility, in a study of *Damalis femoralis,* Londt (1991) demonstrated that although males were marginally larger than females, females were more frequently captured with prey. Although the reasons for the disparities shown above have not been ascertained, it appears that females require more food than males and so the most likely explanation is that they require the added nutrition to complete the maturation of their ovaries.

ACKNOWLEDGEMENT

The authors are indebted to deceased Prof. A.A. Ahmadi (Shiraz University of Iran), Dr. Hamid Sakenin (Ghaemshahr Islamic Azad University), and Mr. Javad Karimi (Ph.D student of Tehran University, Karaj) for loaning many interesting and rare specimens. The research was supported by Tehran Islamic Azad University and Russian Academy of Sciences, Institute of Biology and Soil. We also thank to Prof. A.S. Lelej (Institute of Biology and Soil Science, Vladivostok) for invaluable helps and edition of the manuscript. Our cordial thanks for all taxonomists who identified the prey species (see material and methods).

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